

(19)



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Office européen des brevets



(11)

**EP 0 818 148 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**17.07.2002 Bulletin 2002/29**

(51) Int Cl.<sup>7</sup>: **A22C 7/00**

(21) Application number: **97201269.4**

(22) Date of filing: **28.04.1997**

(54) **Moulding system for moulding a mass, such as a mass of meat**

Formungssystem zur Formung einer Masse wie Fleischmasse

Système de moulage pour mouler une masse telle que masse de viande

(84) Designated Contracting States:  
**AT BE CH DE DK ES FR GB IT LI NL SE**

(30) Priority: **11.07.1996 NL 1003568**

(43) Date of publication of application:  
**14.01.1998 Bulletin 1998/03**

(73) Proprietor: **CFS Bakel B.V.**  
**5760 AA Bakel (NL)**

(72) Inventors:  
• **Baars, Johannes Antonius Barbara Maria**  
**5761 HJ Bakel (NL)**

• **van der Laak, Jacobus Johannes Maria**  
**5763 PM Milheeze (NL)**  
• **Driessen, Johannes Gertrudes Simon**  
**5721 AC Asten (NL)**

(74) Representative: **de Bruijn, Leendert C. et al**  
**Nederlandsch Octroolbureau**  
**P.O. Box 29720**  
**2502 LS Den Haag (NL)**

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## Description

[0001] The invention relates to a moulding system for moulding a mass with a pasty or dough-like composition, such as a mass of meat, for example for moulding hamburgers, comprising a housing having a chamber which is delimited by internal walls of the housing, which chamber emerges on the outside of the housing, as well as a displaceable mould plate, which is formed in a manner corresponding to the chamber, fits with a small degree of play into the chamber and has at least one mould cavity, which housing has a feed opening, which opens into the chamber, for the mass to be moulded, such that, in the position in which the mould plate has been slid into the housing, the mould cavity is in communication with the feed opening and, in the position in which the mould plate has been slid out of the housing, the mould cavity is situated outside the housing.

[0002] A moulding system of this kind is known from NL-A-9301248. The mould plate is situated in a housing which on the underside has a base plate with a feed opening, and on the top side has a ventilation plate for allowing air which is entrained during the feed of the mass and the air which is entrained during the return movement of the mould plate to escape. The base plate and the ventilation plate are held apart from one another by means of lateral guides, which are slightly thicker than the mould plate, so that the latter can move smoothly.

[0003] Owing to these slightly thicker lateral guides, the mould plate fits into the chamber with a small degree of play; since the mould plate is filled under pressure, leakage then occurs as a result. Meat juices and/or runny meat run out between the mould plate and the base plate, leading to loss.

[0004] The object of the invention is to provide a moulding system in which this leakage loss is as low as possible. This object is achieved in that one of the internal walls of the chamber, in the region of the feed opening, has a recess in which a pressure-exerting member is situated, which bears with prestressing against the mould plate. For this purpose, spring elements may be situated between the pressure-exerting member and the mould plate.

[0005] The bearing with prestressing ensures that the play between the mould plate and the internal top wall of the chamber is eliminated, as a result of which scarcely any leakage can take place.

[0006] The pressure-exerting member is preferably situated on that wall of the chamber at which the feed opening emerges and has an opening which coincides with the feed opening.

[0007] According to a preferred embodiment, the pressure-exerting member is a pressure plate and the recess is formed in a manner corresponding to the pressure plate.

[0008] The spring element may be of very varied design. For example, a plurality of regularly distributed

spring elements may be used. According to the invention, the pressure plate may have a groove, which runs around the feed opening, on the side facing the wall of the chamber, in which groove an encircling spring element is situated. An excellent seal around the feed opening can be ensured by means of an encircling spring element of this kind.

[0009] A further improvement of the seal can be achieved if the pressure plate has a further groove with spring element on its part which faces the mouth of the chamber.

[0010] The invention relates to a moulding machine for moulding a mass with a pasty or dough-like composition, such as a mass of meat, for example for moulding hamburgers, comprising a container for the mass to be moulded, pressing means for transporting the mass from the container to a moulding system, as well as discharge means for discharging the moulded products from the moulding system, which moulding system has a housing having a chamber which is delimited by internal walls of the housing, which chamber emerges on the outside of the housing, as well as a displaceable mould plate, which is formed in a manner corresponding to the chamber, fits with a small degree of play into the chamber and has at least one mould cavity, which housing has a feed opening, which opens into the chamber, for the mass to be moulded, such that, in the position in which the mould plate has been slid into the housing, the mould cavity is in communication with the feed opening and, in the position in which the mould plate has been slid out of the housing, the mould cavity is situated outside the housing.

[0011] According to the invention, one of the internal walls of the chamber, in the region of the feed opening, has a recess in which a pressure-exerting member is situated, which bears with prestressing against the mould plate.

[0012] The invention will now be explained in more detail with reference to an exemplary embodiment depicted in the figures.

[0013] Figure 1 shows a moulding machine with a moulding system according to the invention.

[0014] Figure 2 shows a top view of the moulding machine of Figure 1.

[0015] Figure 3 shows the moulding system in side view.

[0016] Figure 4 shows the moulding system along view IV-IV in Figure 3.

[0017] Figure 5 shows a bottom view of part of the pressure plate.

[0018] The moulding machine depicted in Figures 1 and 2 comprises a funnel-like container 1, which at its underside opens into two rotary valves 2. These valves 2 each have a rotary valve body 3, the vertical limb 4 of which opens into the funnel 1, and the horizontal limb 5 of which can be alternately connected to piston-cylinder device 6 (in the situation of Figure 2) and 7.

[0019] A moulding machine of this type is described

in Dutch Patent Application NL-A-9,301,248, and this application is referred to for a further description thereof.

[0020] As can be seen in Figures 1 and 2, the piston-cylinder devices 7 which are not in interaction with the valve bodies 3 are connected via the passage 9 to the feed 10 in the block 11. According to the invention, the moulding system, which is denoted overall by 12, is arranged on this moulding machine, as can be seen in Figure 1.

[0021] As can also be seen in Figures 3 and 4, the moulding system 12 has a housing, which is denoted overall by 13 and comprises a base plate 14, a ventilation plate 15, lateral guides 16 between these two components (see Figure 4) and a closure plate 17 which holds the parts 14, 15 and 16 pressed against one another. The ventilation plate 15 has ventilation holes 30.

[0022] The lateral guides 16, base plate 14 and ventilation plate 15 delimit a chamber 18, in which the mould plate 19 can be displaced between a position moved inwards, which is shown in continuous lines, and a position moved outwards, shown by broken lines.

[0023] The base plate 14 has a feed opening 20 which is connected to the feed 10 of the block 11, as shown in Figure 1. In the moved-in position of the mould plate 19, the mould cavities 21 arranged therein are in communication with the feed opening 20.

[0024] According to the invention, the base plate is provided with a recess 22, in which pressure plate 23 is situated.

[0025] Pressure plate 23 is shown in Figure 5 and has an opening 24 which is aligned with the feed opening 20 in the base plate 14.

[0026] A groove 25 is arranged around this feed opening 24, in which groove a likewise encircling spring element 26, for example a rubber ring or an O-ring, is situated.

[0027] This spring element is supported on the base plate 14, on its region around the feed opening 20. As a result, the pressure plate is held firmly pressed against the mould plate 19, so that any play of the said mould plate 19 in the internal chamber 18 in the housing 13 is eliminated, in the region of the feed opening 20. The spring element 26 also seals the gap between the pressure plate 23 and recess 22.

[0028] By dint of this resilient pressure, scarcely any leakage now takes place between the pressure plate 23 and the mould plate 19. Moreover, this pressure plate, interacting with the mould plate 19, also has a cutting action, such that the fibres of the mass, such as meat fibres, are reliably severed when the mould plate 19 is displaced to its outwardly projecting position.

[0029] In order further to improve the seal of the pressure plate 23 with respect to the mould plate 19, a further groove 27 is provided, in which an additional spring element 28 is situated.

## Claims

1. Moulding system for moulding a mass with a pasty or dough-like composition, such as a mass of meat, for example for moulding hamburgers, comprising a housing (13) having a chamber (18) which is delimited by internal walls of the housing (13), which chamber (18) emerges on the outside of the housing (13), as well as a displaceable mould plate (19), which is formed in a manner corresponding to the chamber (18), fits with a small degree of play into the chamber (18) and has at least one mould cavity (21), which housing (13) has a feed opening (20), which opens into the chamber (18), for the mass to be moulded, such that, in the position in which the mould plate (19) has been slid into the housing (13), the mould cavity (21) is in communication with the feed opening (20) and, in the position in which the mould plate (19) has been slid out of the housing (13), the mould cavity (21) is situated outside the housing (13), **characterized in that** one of the internal walls of the chamber (18), in the region of the feed opening (20), has a recess (22) in which a pressure-exerting member (23) is situated, which bears with prestressing against the mould plate (19) in order to provide a good seal and cutting action.
2. Moulding system according to Claim 1, spring elements (26, 28) being situated between the pressure-exerting member (23) and the base plate (14).
3. Moulding system according to one of the preceding claims, the pressure-exerting member (23) being situated on that wall of the chamber (18) at which the feed opening (20) emerges.
4. Moulding system according to Claim 3, the pressure-exerting member (23) having an opening (24) which coincides with the feed opening (20).
5. Moulding system according to one of the preceding claims, the pressure-exerting member being a pressure plate (23) and the recess (22) being formed in a manner corresponding to the pressure plate (23).
6. Moulding system according to Claims 4 and 5, the pressure plate (23) having a groove (25), which runs around the opening (24), on the side remote from the chamber (18), in which groove (25) an encircling spring element (26) is situated.
7. Moulding system according to Claim 6, the pressure plate (23) having a further groove (27) with spring element (28) on its part which faces the mouth (30) of the chamber (18).
8. Moulding machine for moulding a mass with a pasty or dough-like composition, such as a mass of meat,

for example for moulding hamburgers, comprising a container (1) for the mass to be moulded, pressing means (6, 7) for transporting the mass from the container (1) to a moulding system (12), as well as discharge means for discharging the moulded products from the moulding system (12), which moulding system (12) has a housing (13) having a chamber (18) which is delimited by internal walls of the housing (13), which chamber (18) emerges on the outside of the housing (13), as well as a displaceable mould plate (19), which is formed in a manner corresponding to the chamber (18), fits with a small degree of play into the chamber (18) and has at least one mould cavity (21), which housing (13) has a feed opening (20), which opens into the chamber (18), for the mass to be moulded, such that, in the position in which the mould plate (19) has been slid into the housing (13), the mould cavity (21) is in communication with the feed opening (20) and, in the position in which the mould plate (19) has been slid out of the housing (13), the mould cavity (21) is situated outside the housing (13), **characterized in that** one of the internal walls of the chamber (18), in the region of the feed opening (20), has a recess (22) in which a pressure-exerting member (23) is situated, which bears with prestressing against the mould plate (19).

#### Patentansprüche

1. Formgebungssystem zum Formen einer Masse mit einer brei- oder teigartigen Zusammensetzung, wie einer Fleischmasse, beispielsweise zum Formen von Hamburgern, umfassend ein Gehäuse (13) mit einer Kammer (18), die durch Innenwände des Gehäuses (13) begrenzt wird, welche Kammer (18) auf der Außenseite des Gehäuses (13) mündet, sowie eine verschiebbare Formplatte (19), die auf eine der Kammer (18) entsprechende Weise ausgebildet ist, mit einem kleinen Maß an Spiel in die Kammer (18) passt und mindestens einen Formhohlraum (21) aufweist, welches Gehäuse (13) eine Beschickungsöffnung (20), die sich in die Kammer (18) öffnet, für die zu formende Masse aufweist, so dass in der Position, in der die Formplatte (19) in das Gehäuse (13) hineingeschoben worden ist, der Formhohlraum (21) mit der Beschickungsöffnung (20) in Verbindung steht, und in der Position, in der die Formplatte (19) aus dem Gehäuse (13) herausgeschoben worden ist, sich der Formhohlraum (21) außerhalb des Gehäuses (13) befindet, **dadurch gekennzeichnet, dass** eine der Innenwände der Kammer (18) im Bereich der Beschickungsöffnung (20) eine Vertiefung (22) aufweist, in der sich ein Druck ausübendes Element (23) befindet, das mit Vorspannung gegen die Formplatte (19) anliegt, um für eine gute Dichtung und Schneidwirkung zu sor-

gen.

2. Formgebungssystem nach Anspruch 1, wobei sich Federelemente (26, 28) zwischen dem Druck ausübenden Element (23) und der Basisplatte (14) befinden.
3. Formgebungssystem nach einem der vorangehenden Ansprüche, wobei sich das Druck ausübende Element (23) auf derjenigen Wand der Kammer (18) befindet, an der die Beschickungsöffnung (20) mündet.
4. Formgebungssystem nach Anspruch 3, wobei das Druck ausübende Element (23) eine Öffnung (24) aufweist, die mit der Beschickungsöffnung (20) zusammenfällt.
5. Formgebungssystem nach einem der vorangehenden Ansprüche, wobei das Druck ausübende Element eine Druckplatte (23) ist und die Vertiefung (22) auf eine der Druckplatte (23) entsprechende Weise ausgebildet ist.
6. Formgebungssystem nach den Ansprüchen 4 und 5, wobei die Druckplatte (23) eine Nut (25) aufweist, die auf der von der Kammer (18) abgewandten Seite um die Öffnung (24) herum verläuft, in welcher Nut (25) sich ein umgebendes Federelement (26) befindet.
7. Formgebungssystem nach Anspruch 6, wobei die Druckplatte (23) eine weitere Nut (27) mit Federelement (28) auf ihrem Teil aufweist, der der Mündung (30) der Kammer (18) gegenüberliegt.
8. Formgebungsmaschine zum Formen einer Masse mit einer brei- oder teigartigen Zusammensetzung, wie einer Fleischmasse, beispielsweise zum Formen von Hamburgern, umfassend einen Behälter (1) für die zu formende Masse, Presseinrichtungen (6,7) zum Transportieren der Masse aus dem Behälter (1) zu einem Formgebungssystem (12), sowie Austrageinrichtungen zum Austragen der geformten Produkte aus dem Formgebungssystem (12), welches Formgebungssystem (12) aufweist: ein Gehäuse (13) mit einer Kammer (18), die durch Innenwände des Gehäuses (13) begrenzt wird, welche Kammer (18) auf der Außenseite des Gehäuses (13) mündet, sowie eine verschiebbare Formplatte (19), die auf eine der Kammer (18) entsprechende Weise ausgebildet ist, mit einem kleinen Maß an Spiel in die Kammer (18) passt und mindestens einen Formhohlraum (21) aufweist, welches Gehäuse (13) eine Beschickungsöffnung (20), die sich in die Kammer (18) öffnet, für die zu formende Masse aufweist, so dass in der Position, in der die Formplatte (19) in das Gehäuse (13) hineingescho-

ben worden ist, der Formhohlraum (21) mit der Beschickungsöffnung (20) in Verbindung steht, und in der Position, in der die Formplatte (19) aus dem Gehäuse (13) herausgeschoben worden ist, sich der Formhohlraum (21) außerhalb des Gehäuses (13) befindet, **dadurch gekennzeichnet, dass** eine der Innenwände der Kammer (18) im Bereich der Beschickungsöffnung (20) eine Vertiefung (22) aufweist, in der sich ein Druck ausübendes Element (23) befindet, das mit Vorspannung gegen die Formplatte (19) anliegt.

## Revendications

1. Système de moulage destiné à mouler une masse avec une composition pâteuse ou semi-pâteuse, telle qu'une masse de viande, par exemple destiné à mouler des hamburgers, comportant un boîtier (13) ayant une chambre (18) qui est délimitée par des parois internes du boîtier (13), laquelle chambre (18) sort à l'extérieur du boîtier (13), ainsi qu'une plaque de moulage mobile (19), qui est formée d'une manière correspondant à la chambre (18), s'ajuste avec un faible degré de jeu dans la chambre (18) et possède au moins une cavité de moulage (21), lequel boîtier (13) a une ouverture d'alimentation (20), qui s'ouvre dans la chambre (18), pour la masse devant être moulée, de telle sorte que, dans la position dans laquelle la plaque de moulage (19) a été glissée dans le boîtier (13), la cavité de moulage (21) est en communication avec l'ouverture d'alimentation (20) et, dans la position dans laquelle la plaque de moulage (19) a été glissée hors du boîtier (13), la cavité de moulage (21) est située à l'extérieur du boîtier (13), **caractérisé en ce qu'une** des parois internes de la chambre (18), dans la zone de l'ouverture d'alimentation (20), a un renforcement (22) dans lequel est situé un élément exerçant une pression (23), qui porte avec une précontrainte contre la plaque de moulage (19) afin d'assurer une bonne étanchéité et une action de coupe.

2. Système de moulage selon la revendication 1, des éléments de ressort (26, 28) étant situés entre l'élément exerçant une pression (23) et la plaque de base (14).

3. Système de moulage selon l'une des revendications précédentes, l'élément exerçant une pression (23) étant situé sur la paroi de la chambre (18) où sort l'ouverture d'alimentation (20).

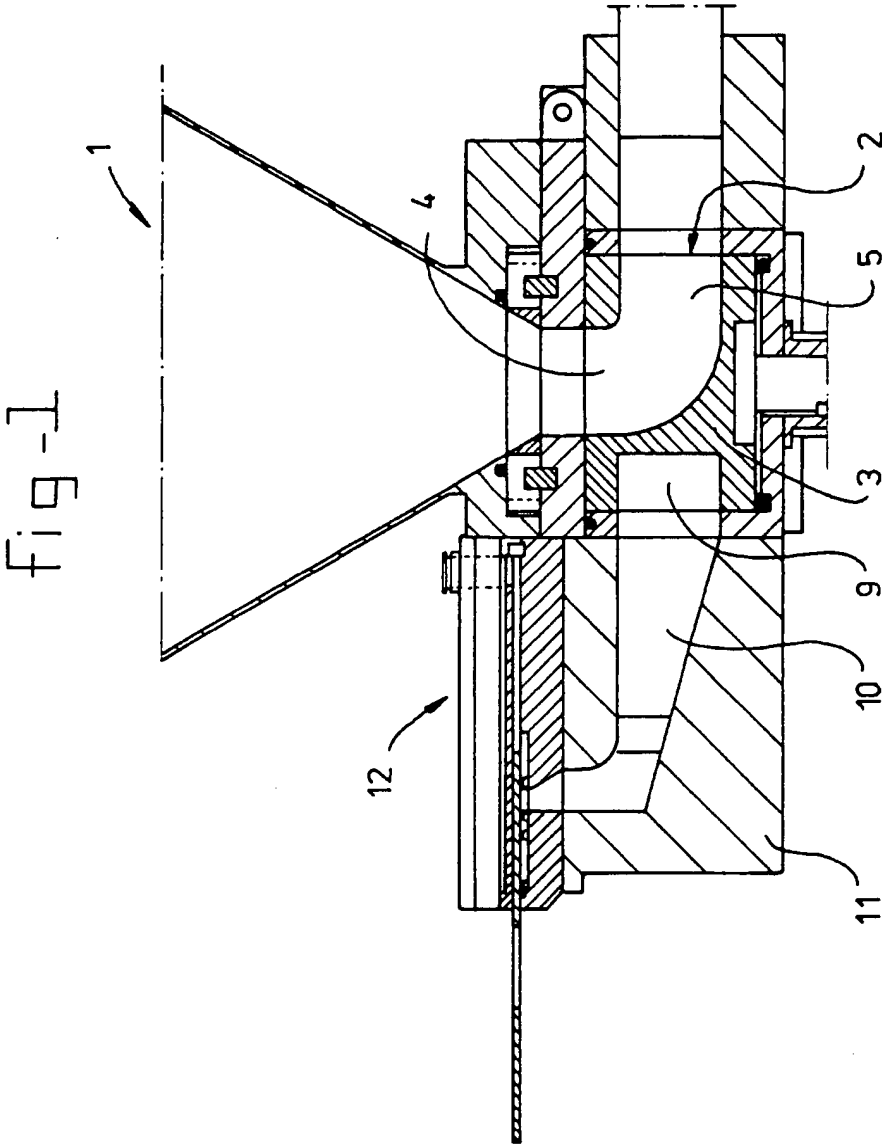
4. Système de moulage selon la revendication 3, l'élément exerçant une pression (23) ayant une ouverture (24) qui coïncide avec l'ouverture d'alimentation (20).

5. Système de moulage selon l'une des revendications précédentes, l'élément exerçant une pression étant une plaque de pression (23) et le renforcement (22) étant formé d'une manière correspondant à la plaque de pression (23).

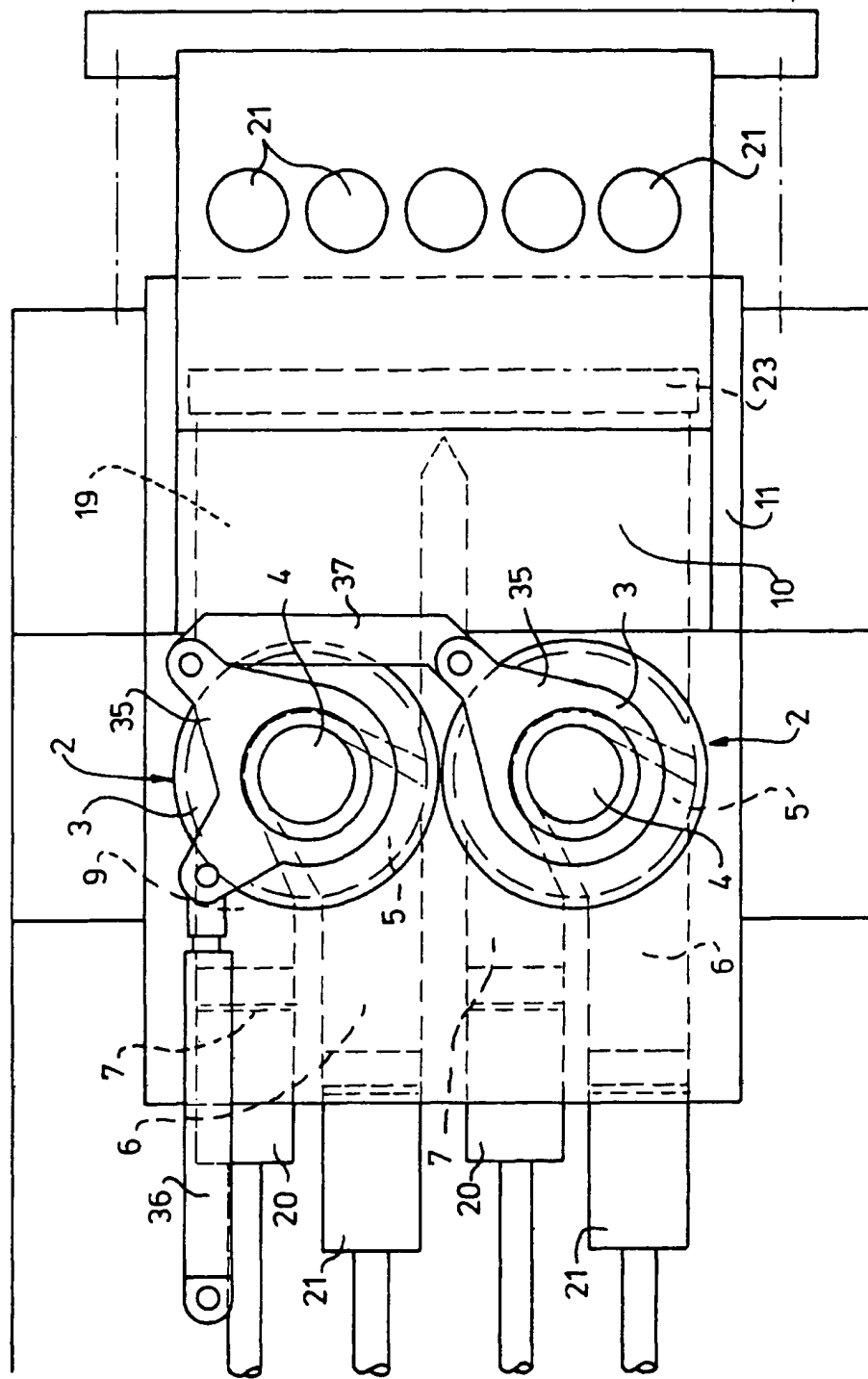
6. Système de moulage selon les revendications 4 et 5, la plaque de pression (23) ayant une rainure (25), qui s'étend autour de l'ouverture (24), sur le côté éloigné de la chambre (18), un élément de ressort circulaire (26) se trouve dans cette rainure (25).

7. Système de moulage selon la revendication 6, la plaque de pression (23) ayant une rainure supplémentaire (27) avec un élément de ressort (28) sur sa partie qui fait face à l'embouchure (30) de la chambre (18).

8. Machine de moulage destinée à mouler une masse avec une composition pâteuse ou semi-pâteuse, telle qu'une masse de viande, par exemple destinée à mouler des hamburgers, comportant un récipient (1) pour la masse devant être moulée, des moyens de pression (6, 7) destinés à transporter la masse depuis le récipient (1) jusqu'à un système de moulage (12), ainsi que des moyens d'évacuation destinés à évacuer les produits moulés du système de moulage (12), lequel système de moulage (12) a un boîtier (13) ayant une chambre (18) qui est délimitée par des parois internes du boîtier (13), laquelle chambre (18) sort de l'extérieur du boîtier (13), ainsi qu'une plaque de moulage mobile (19), qui est formée d'une manière correspondant à la chambre (18), s'ajuste avec un faible degré de jeu dans la chambre (18) et a au moins une cavité de moulage (21), lequel boîtier (13) possède une ouverture d'alimentation (20), qui s'ouvre dans la chambre (18), pour la masse devant être moulée, de telle sorte que, dans la position dans laquelle la plaque de moulage (19) a été glissée dans le boîtier (13), la cavité de moulage (21) est en communication avec l'ouverture d'alimentation (20) et, dans la position dans laquelle la plaque de moulage (19) a été glissée hors du boîtier, la cavité de moulage (21) est située à l'extérieur du boîtier (13), **caractérisée en ce qu'une** des parois internes de la chambre (18), dans la zone de l'ouverture d'alimentation (20), a un renforcement (22) dans lequel est situé un élément exerçant une pression (23), lequel porte avec une précontrainte contre la plaque de moulage (19).



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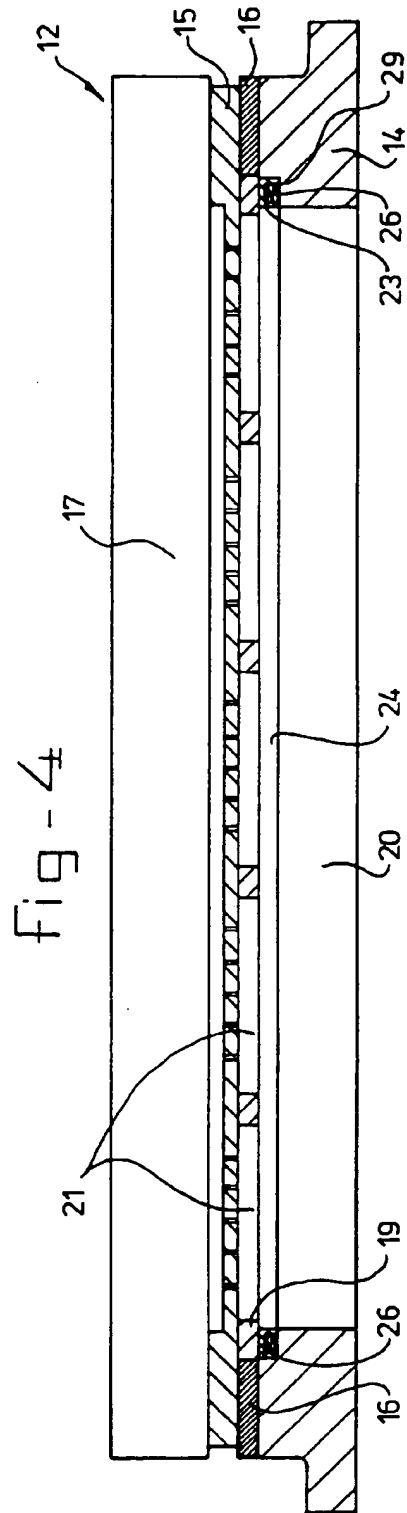
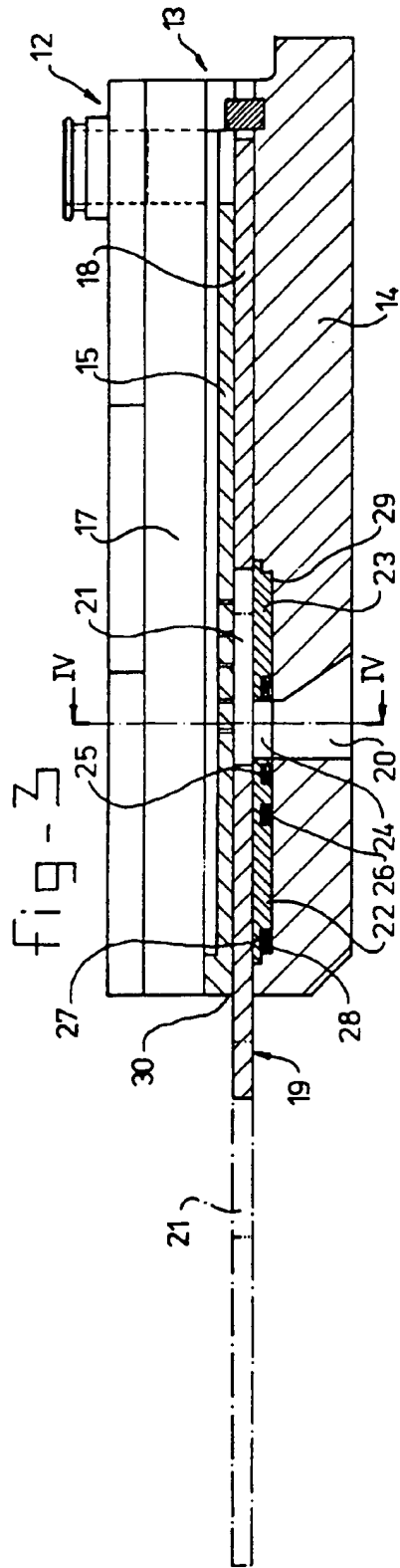


fig-5

